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09/718,932	11/22/2000	Mark Pavier	IR-17732-2498	2141

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EXAMINER

ROMAN, ANGEL

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 06/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/718,932

Applicant(s)

PAVIER, MARK

Examiner

Angel Roman

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 April 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 2812

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on 04/11/03. These drawings are acceptable.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2 and 5, 8 and 12 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Umehara et al. U.S. Patent 5,882,956 A.

Umehara et al. discloses a process of connecting a semiconductor die to a lead frame (see column 7, lines 39-41) substrate having a top surface, said process comprising the steps of; providing a thin, flexible, heat curable polyimide, insulative film 4 which is of a first area (see column 6, lines 27-33); laying (performed as part of thermo-compression bonding process) said flexible film on a thin semiconductor wafer 6 of a second area, said semiconductor wafer being provided with a plurality of spaced apart semiconductor die (see column 1, lines 5-15), each of said semiconductor die

Art Unit: 2812

having a respective third area which is substantially less than said first area (see figure 3); preheating said semiconductor wafer and said film to partially cure said film (thermo-compression bonding), thereby forming adhesion between said thin flexible film and said semiconductor wafer (see column 7, lines 27-29); thereafter simultaneously singulating both said thin flexible film and said plurality of identical semiconductor die to form individual elements (see figure 4); heating said substrate (see column 7, lines 41-45); thereafter placing at least one of said singulated semiconductor to the top surface of said substrate surface with the film on said die pressed against said top surface and adhered thereto; and thereafter heating said one semiconductor die to fully cure said thin flexible film to firmly adhere said die to said substrate (see column 7, lines 38-51). The film on said die has the same or different area as that of said die after assembly onto said substrate (see figure 5). Said first area is substantially identical to, or different from, said second area (see figure 3).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Umehara et al. U.S. Patent 5,882,956 A in view of Goida et al. U.S. Patent 5,804,753 A.

Umehara et al. is applied as above but lacks anticipation on adhering a second semiconductor die with a second adhesive film thereon to said substrate at a position laterally removed from the first die. Goida et al. discloses adhering a second semiconductor die with a second adhesive film thereon to a substrate at a position laterally removed from a first die (see figure 8). In view of this disclosure, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to disclosed a step of adhering two dies on a lead frame as disclosed in Goida et al. in the primary reference of Umehara et al. since packaging production could be reduced.

6. Claims 7, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umehara et al. U.S. Patent 5,882,956 A in view of Takiar et al. U.S. Patent 5,442,435.

Umehara et al. is applied as above but lacks anticipation on adhering a second die with a second adhesive film thereon to the top of said die secured to said substrate and a process wherein said adhesive film has a smaller area than said top surface of said die and wherein said second die and said second adhesive film both have the same area as said adhesive film.

With respect to adhering a second die with a second adhesive film thereon to a top of a die secured to a substrate, Takiar et al. discloses adhering a second die with a second adhesive film thereon to a top of a die secured to a substrate (see figure 3). In view of this disclosure it would have been obvious to a person having ordinary skills in

the art at the time the invention was made to adhere a second die with a second adhesive film thereon to a top of a die secured to a substrate as disclose in Takiar et al. in the primary reference of Umehara et al. since packaging manufacturing costs may be reduced.

Regarding a process wherein an adhesive film has a smaller area than a top surface of a die and wherein a second die and a second adhesive film both have the same area as said adhesive film. This limitation, is only considered to be an obvious modification of the shape of the area disclosed by Takiar et al., as the courts have held that a change in shape or configuration, without any criticality, is within the level of skill in the art as the particular shape claimed by applicant is nothing more than one of numerous shapes that a person having ordinary skill in the art will find obvious to provide using routine experimentation based on its suitability for the intended use of the invention. See In re Dailey, 149 USPQ 47 (CCPA 1976).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Umehara et al. U.S. Patent 5,882,956 A in view of Nakabayashi U.S. Patent 6,215,194 B1.

Umehara et al is applied as above but lacks anticipation on disclosing a pick and place apparatus for picking the diced IC chips from the dicing tape and placing them on a lead frame. Nakabayashi discloses removing a dice and film to a substrate using a pick and place apparatus (see figure 1D). In view of this disclosure it would have been obvious to a person having ordinary skills in the art at the time the invention was made to remove the dice and film to said substrate by a pick and place apparatus in the

Art Unit: 2812

primary reference of Umehara et al. by using the pick and place method disclosed in Nakabayashi since process cost may be reduce by improving productivity.

Response to Arguments

8. Applicant's arguments with respect to claims 1, 2 and 5-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sheyon et al. and Komiyama et al. disclose methods of forming semiconductor devices by singulating wafers using polyimide adhesive films.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2812


the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel Roman whose telephone number is (703) 306-0207. The examiner can normally be reached on Monday-Friday 8:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (703) 308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

AR
June 9, 2003


John F. Niebling
Supervisory Patent Examiner
Technology Center